

Transpiration Cooled Thrust Chamber Technology, Phase I

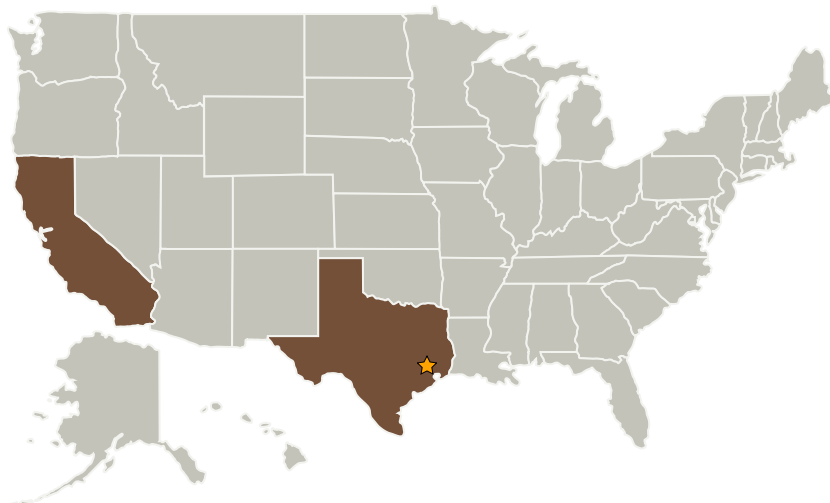
Completed Technology Project (2007 - 2007)



Project Introduction

NASA has determined that it requires extremely durable, high-performance, low cost engines to meet future multi-use in-space, non-toxic, cryogenic propulsion requirements such as orbit transfer, descent, ascent and pulsing attitude control. Transpiration-cooling technology has long been considered a candidate for long-life thrust chambers but has never been deployed on a domestic rocket engine. In this program WASK Engineering, Inc. demonstrates methane transpiration cooling of an oxygen/methane thrust chamber at 260 psia chamber pressure and a range of mixture ratios up to 3.2 O/F in a 65 lbf engine assembly. Key tasks are the design and fabrication of a transpiration-cooled chamber spool section that integrates into existing hardware from an on-going USAF program and then hot fire testing it in the existing test stand. Post-test data analyses are used to anchor and refine thermal and performance algorithms in transpiration cooling models that then validate, or invalidate, transpiration cooled thrust chambers for this set of requirements.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

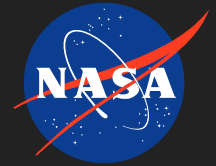
Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
WASK Engineering, Inc.	Supporting Organization	Industry Small Disadvantaged Business (SDB)	Cameron Park, California

Primary U.S. Work Locations

California	Texas
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX01 Propulsion Systems
 - └ TX01.1 Chemical Space Propulsion
 - └ TX01.1.3 Cryogenic